## AMENDMENTS

**IN THE CLAIMS:**

*Please cancel claims 8, 9, 12 and 26, and amend claims 1, 14, 19, 22 and 24 as provided below:*

1. (Currently amended) An ion implantation system suitable for use in implanting ions into one or more workpieces comprising:

an ion source for producing a quantity of ions which can be extracted in the form of an ion beam, the ion beam having a beam current density;

a beamline assembly downstream of the ion source to receive and direct the beam of ions;

an end station downstream of the beamline assembly to hold the one or more workpieces toward which the ion beam is directed;

a component downstream of the ion source for modulating the ion beam current density via at least one of a generated electric and magnetic field; and

a measurement component for taking readings of beam current, the modulating component adjusting the beam current density in response to readings taken by the measurement component.

2. (Original) The system of claim 1, wherein the modulating component comprises one or more plates of an ion beam accelerator.

3. (Original) The system of claim 1, wherein the modulating component comprises a ground electrode.

4. (Original) The system of claim 1, wherein the modulating component comprises a set of electrically conductive plates located between the ion source and the beamline assembly.

5. (Original) The system of claim 1, wherein the beamline assembly includes an analyzer magnet to mass resolve ions within the beam, the modulating component comprising an electrode downstream of the analyzer magnet.

6. (Original) The system of claim 1, wherein the modulating component comprises a set of electrically conductive plates defining a resolving aperture of the beamline assembly.

7. (Original) The system of claim 1, wherein the modulating component comprises an electrode located downstream of a resolving aperture of the beamline assembly.

8. (Canceled).

9. (Canceled).

10. (Original) The system of claim 1, wherein the modulating component comprises an extraction suppression electrode located close to the ion source.

11. (Original) The system of claim 1, wherein the modulating component comprises a source magnet that assists with generating ions within the ion source, the source magnet located close to the ion source.

12. (Canceled).

13. (Original) The system of claim 1, wherein the measurement component is utilized in developing implantation wavéforms that are employed in modulating the beam current.

14. (Currently amended) The system of claim 12, wherein the measurement component comprises at least one of a Faraday cup and terminal return current.

15. (Original) The system of claim 1 further comprising a controller for selectively controlling the modulating component in response to readings taken by the measurement component.

16. (Original) The system of claim 1, wherein the beam current is modulated between at least one of a frequency of about 1 - 1000 Hz and a range of about 10 - 20% of the beam current.

17. (Original) The system of claim 1, wherein the measurement component takes readings of beam current during the ion implantation process to facilitate feedback or closed-loop adjustments to the beam current.

18. (Original) The system of claim 1, wherein the measurement component takes readings of beam current prior to the ion implantation process to facilitate open loop adjustments to the beam current.

19. (Currently amended) An ion implantation system suitable for use in implanting ions into one or more workpieces comprising:

an ion source for producing a quantity of ions which can be extracted in the form of an ion beam, the ion beam having a beam current density;

a beamline assembly downstream of the ion source to receive and direct the beam of ions;

an end station downstream of the beamline assembly to hold the one or more workpieces toward which the ion beam is directed;

a component downstream of the ion source for modulating the ion beam current density via at least one of a generated electric and magnetic field; and

a measurement component for taking readings of beam current at one or more points during ion implantation, the modulating component adjusting the beam current density in response to readings taken by the measurement component,

wherein the modulating component includes at least one of

_____one or more plates of an ion beam accelerator,

_____a ground electrode,

_____a set of electrically conductive plates located between the ion source and the beamline assembly,

_____and electrode downstream of an analyzer magnet within the beamline assembly that mass resolves ions within the beam,

_____a set of electrically conductive plates defining a resolving aperture of the beamline assembly,

_____an electrode located downstream of a resolving aperture of the beamline assembly,

~~_____a source of plasma operable to neutralize a positive charge that may otherwise accumulate on the one or more workpieces,~~

~~_____a set of deflection electrodes,~~

_____an extraction suppression electrode located close to the ion source,

~~_____a mechanical structure that selectively blocks a portion of the ion beam,~~ and

_____a source magnet that assists with generating ions within the ion source, the source magnet located close to the ion source.

20. (Original) The system of claim 19, wherein the measurement component is utilized in developing implantation waveforms that are employed in modulating the beam current.

21. (Original) The system of claim 20, wherein the measurement component comprises at least one of a Faraday cup and terminal return current.

22. (Currently amended) An acceleration system suitable for use in implanting ions into a workpiece comprising:

an ion source for producing a quantity of ions which can be extracted in the form of an ion beam, the ion beam having a beam current density;

a beamline assembly downstream of the ion source to receive and direct the beam of ions;

an end station downstream of the beamline assembly to hold one or more workpieces onto which the ion beam is directed;

a first modulating component associated with the ion source for modulating the beam current density via at least one of a generated electric and magnetic field; and

a second modulating component downstream of the ion source for selectively modulating the ion beam current density via at least one of a generated electric and magnetic field.

23. (Original) The system of claim 22, wherein the first modulating component comprises a source magnet that assists with producing ions within the ion source.

24. (Currently amended) The system of claim 22 further comprising:

a measurement component for taking readings of beam current at one or more points during ion implantation; and

a controller operatively coupled to the measurement component, the controller selectively adjusting at least one of the first and second modulating components ~~and the source magnet~~in response to readings taken by the measurement component.

25. (Original) The system of claim 22, wherein the second modulating component comprises one or more electrically conductive members situated along the beam path.

26. (Canceled).